

## **GUTTER AND DOWNSPOUT SYSTEM FOR A TENT OR SHELTER**

### **TECHNICAL FIELD OF THE INVENTION**

(0001) The present invention generally relates to tents and shelters, and more particularly to tent and shelter construction.

### **BACKGROUND OF THE INVENTION**

(0002) Camping is a popular recreational activity enjoyed by many. Some people camp so that they may enjoy the outdoors, and others use camping as an inexpensive alternative to staying in a hotel.

(0003) Typically, campers sleep in a tent while camping. Tents are portable shelters made of lightweight, often waterproof, fabrics. Typically, the fabric is stretched over and sustained by a frame. Tents are used for camping outdoors or as temporary structures, and come in a variety of shapes and sizes. The most popular shape is the dome, or free standing, model. This model is easy to set up and does not require support from tree limbs or other objects.

(0004) Another structure that is often used while camping is a shelter. In general, a shelter is a structure, typically a frame with poles, that includes a covering or

canopy that provides protection from the rain, insects, and/or the sun. For camping, a shelter is typically made of fabric and foldable poles so that the shelter may be folded into a compact configuration for transport and storage. The shelter may or may not have walls, such as screen walls. The shelter may be, for example, set up over a picnic area, used adjacent to a tent as a storage area, configured to serve as protection from the rain, or used as a screened area to avoid insects.

(0005) The advent of new waterproof materials typically prevents a shelter canopy as well as a rain fly for a tent from leaking. Thus, rain flies and shelter canopies typically work well to shelter a tent or other items underneath the covering. However, one problem with the use of such coverings is that water draining off of a rain fly or a shelter canopy may drip in undesirable areas, such as at a tent door or at tent windows. In addition, a hard rain may cause a large amount of water to flow off of a covering and may cause considerable splashing or splatter, especially for shelters, which typically have canopies that are spaced higher from the ground than a tent rain fly.

### SUMMARY OF THE INVENTION

(0006) The following presents a simplified summary of some embodiments of the invention in order to provide a basic understanding of the invention. This summary is not an extensive overview of the invention. It is not intended to identify key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some embodiments of the invention in a simplified form as a prelude to the more detailed description that is presented later.

(0007) In accordance with an embodiment of the invention, a gutter and downspout system is provided that may be used with a tent, shelter, or other fabric structure. As one example, the gutter may be aligned along a rain fly edge to direct water away from the tent door or tent windows. After the rainwater is directed the proper distance to clear the tent door and/or windows, the water can fall from the rain fly to the ground. Alternatively, in accordance with an aspect of the invention, the rainwater may be directed via a downspout to the ground. Thus, a camper can enter or exit the tent through the door without the water dripping on the camper. In addition, windows may be left partially open during a rain shower without the rainwater runoff entering the

tent through the open window(s). Also, rainwater flow off a shelter may be controlled and/or directed.

(0008) In accordance with an embodiment of the invention, the gutter is formed of a flexible material that is sewn to the rain fly or to the canopy. In accordance with another embodiment of the invention, the flexible material is positioned inside the trim fabric for the rain fly or canopy. In accordance with yet another embodiment of the invention, the flexible material is sufficiently flexible to allow compact packing of the rain fly or canopy when not in use. The flexible material may, for example, be formed of closed cell polyethylene or another flexible tube extrusion. The gutter may be aligned along edges of the rain fly or shelter canopy. Alternatively, if a shortened version of a gutter is used, then the shortened version of the gutter may be sufficient to allow rainwater runoff to miss a tent door and/or windows. In accordance with an embodiment of the invention, the gutter material may also be positioned at locations other than at the edge of the rain fly or shelter canopy.

(0009) In accordance with an embodiment of the invention, a downspout may be provided that enhances water control of rainwater runoff. The downspout may include, for

example, a flexible ring at an upper portion connected to an elongate waterproof fabric tube. The end of the tube may be arranged and directed as wanted. The attachment of the downspout to a rain fly or shelter canopy may be permanent or removable. The downspout directs rainwater runoff completely away from the tent or shelter area so that pooling or accumulation of water under or around the tent or shelter is eliminated.

(0010) Other features of the invention will become apparent from the following detailed description when taken in conjunction with the drawings, in which:

### **BRIEF DESCRIPTION OF THE DRAWINGS**

(0011) FIG. 1 is a side perspective view of a tent incorporating an embodiment of the invention;

(0012) FIG. 2 is a top perspective view of a second tent incorporating an embodiment of the invention;

(0013) FIG. 3 is a cross-sectional view taken along the section lines 3--3 of FIG. 1, showing a gutter for use with the tent of FIG. 1;

(0014) FIG. 4 is a cross-sectional view showing the gutter of FIG. 3, similar to FIG. 3, showing the gutter's response to water flowing on a rain fly for the tent of FIG. 1;

(0015) FIG. 5 is a cross-sectional view, similar to FIG. 3, showing an alternate embodiment of a gutter; and

(0016) FIG. 6 is a cross-sectional view, similar to FIG. 3, showing another alternate embodiment of a gutter.

### DETAILED DESCRIPTION

(0017) In the following description, various embodiments of the present invention will be described. For purposes of explanation, specific configurations and details are set forth in order to provide a thorough understanding of the embodiments. However, it will also be apparent to one skilled in the art that the present invention may be practiced without the specific details. Furthermore, well-known features may be omitted or simplified in order not to obscure the embodiment being described.

(0018) Referring now to the drawings, in which like reference numerals represent like parts throughout the several views, FIG. 1 shows a tent 20 incorporating an embodiment of the invention. The tent 20 shown in the drawings is a simplified model, and poles and specific details for the tent 20 are not shown. However, the general configuration and manufacture of tents is known, and thus a specific configuration is omitted or simplified in order to not obscure the embodiments of the invention being described.

(0019) The tent 20 includes a rain fly 22 covering a top portion of the tent 20. The tent 20 also includes a door 24 and windows 26 and 28 on sides of the tent 20. In the embodiment shown, the rain fly 22 extends out beyond the door

24 and the windows 26, 28. However, embodiments of the present invention can be used with tents having a different structure.

(0020) The rain fly 22 shown in the drawings includes a top 30, and side edges 32, 34, and 36. In the drawings, the side edge 32 is to the right, the side edge 34 is to the front, and the side edge 36 is to the left.

(0021) In accordance with an embodiment of the invention, a gutter or gutters may be provided on the rain fly 22 or on a rain fly for another tent. In fact, although the embodiments described are discussed with reference to the rain fly 22 for the tent 20, embodiments of the invention may be used for any covering in which it is desired to direct rainwater runoff, including, but not limited to, canopies, shelters, and tarpaulins.

(0022) In the embodiment shown, a gutter is not included on the right side edge 32 of the rain fly 22. However, a full gutter 40 extends along the entire length of the front side edge 34. A partial gutter 42 extends a portion of the length of the left side edge 36. The full gutter 40 redirects water heading toward the front side edge 34 to corners 46, 48 of the rain fly 22. The partial gutter 42 directs water away from the window 26, but because it does not



extend to the corner 48 or an opposite corner 50, the partial gutter 42 only provides partial redirecting of water from the side edge 36.

(0023) FIG. 3 shows a cross-section of the full gutter 40. The example shown in FIG. 3 is but one embodiment of a gutter style that may be used in accordance with the present invention. In general, the gutter of the present invention includes a structure attached to a top of the rain fly 22 or other covering that is configured to form a dam to the flow of water beyond the structure. The structure may be, as examples, a bead, a protrusion, or a sewn formation at the top 52 of the rain fly 22. A structure for the gutter may also bend the fabric of the rain fly 22 so as to form such a structure. To this end, the structure for the gutter (e.g., the full gutter 40) may be attached to a bottom 54 of the rain fly 22 and protrudes up through the rain fly. However, with respect to the full gutter 40 described with reference to FIG. 3, the structure is attached to the top 52 of the rain fly 22.

(0024) In the embodiment shown in FIG. 3, the full gutter 40 is formed as a part of an attachment to trim material 56. As is known, trim material (e.g., the trim material 56) is often added to rain flies, canopies, or other structures, so as to reinforce the outer edges of the fabric

covering. Typically, the trim material is wrapped around the edge and sewn to itself, providing a protecting barrier for the outer edge of the covering. However, as used herein, "trim material" represents any fabric strip that may be attached to the rain fly 22 or other covering.

(0025) In the embodiment shown in FIG. 3, the trim material 56 includes a bead 58 wrapped therein. The bead 58 and the trim material 56 provide the gutter function, as is further described below.

(0026) The trim material 56 is aligned beginning at a top end 60 along the top 52 of the rain fly 22. The trim material 56 then extends in a loop 62 around the bead 58 and then is overlapped over the top end 60 in an overlap section 64. The trim material 56 then wraps around under the bottom 54 of the rain fly 22 and terminates at a bottom end 66.

(0027) In the embodiment shown, the trim material 56 may be glued, sewn, or otherwise attached to the top 52 and/or bottom 54 of the rain fly 22. In accordance with an embodiment of the invention, the trim material 56 is attached so that the overlap section 64 is fixed to the top end 60 so that a break 68 occurs in the trim material 56 between an attached portion of the overlap section 64 and the loop 62. This break 68 is the point at which the overlap section 64 is

no longer attached to the top end 60. The top end 60 of the trim material 56 is attached to the top 52 of the rain fly 22 up to this same break 68.

(0028) Thus, in accordance with this embodiment of the invention, the loop 62 is not attached to the rain fly 22, permitting the loop 62 to move to the position shown in FIG. 4. This feature permits water W flowing down the top 52 of the rain fly 22 to press between the loop 62 and the top 52 of the rain fly 22 and to drive the loop 62 and the bead 58 upward and outward, rotating about the break 68. The attachment of the top end 60 to the top 52 of the rain fly 22 prevents continued rotation of the loop 62 and the bead 58 about the break 68, and preferably is stopped so that a wall is formed by the back side of the loop 62 that is somewhat perpendicular to the top 52 of the rain fly 22. This allows water W (FIG. 4) to be trapped at the back side of the full gutter 40, preventing some spillage over the full gutter 40. The water W may then travel down the full gutter 40 by gravity to the respective corner 46 or 48.

(0029) If desired, the trim material 56 may be attached at a location other than at an edge of the rain fly 22. For example, in the embodiment of a tent 70 shown in FIG. 2, gutters 72 and 74 are positioned at locations on a rain fly

76 that are removed from edges 78, 79 of the rain fly 76. These gutters 72, 74 may be used to control some or most of rainwater runoff, or may be used to preferably control direction of some water in accordance with a configuration of the particular rain fly or other covering.

(0030) The gutters 72, 74 may be attached in a manner similar to the gutter 40 described with reference to FIGS. 3 and 4. However, in such an embodiment, if trim material similar to the trim material 56 is used, that trim material, for obvious reasons, will not overlap to the bottom portion of the rain fly 76, but instead would terminate, for example at the bend 89 of the trim material 56 in FIG. 3.

(0031) Returning to a description of the bead 58, the bead 58 is preferably a flexible material to allow compact packing of the rain fly 22 when not in use. As an example, the bead 58 may be a closed cell polyethylene foam extrusion, having a round cross section, or alternatively a cross section of another suitable shape. The bead 58 may also be a flexible polyvinyl chloride extruded tube. In an example of a gutter 80 shown in FIG. 5, the bead 82 is hollow. In another example of a gutter 86 shown in FIG. 6, the bead 88 has a square cross section. Other suitable cross sections may be used.

(0032) As described above, the gutter system of the

present invention provides a gutter geometry that resists the flow of water down a rain fly (e.g., the rain fly 22) and provides a damming effect for that water. This damming effect provides a resistance to stop the flow of water over the gutter, such as at a rain fly edge, and directs the water parallel to the gutter toward the end of the gutter which may, for example, be at a rain fly corner 46 or 48. Alternatively, if a partial gutter 42 is used, the water may be directed to the ends of the gutter which may correspond, for example, to just beyond the outer edges of the window 26. Alternatively, as also described above with reference to FIG. 2, a gutter such as the gutter 72 or 74 may be provided at other areas of a rain fly or other covering rather than at the edge of the covering. This use of the gutter system allows control of selective rainwater runoff and may be advantageous for particular geometries of coverings.

(0033) In accordance with an embodiment of the invention, a downspout 100 (e.g., FIGS. 1 and 2) may be provided at a corner or at another suitable location on the rain fly 22 or other covering. In accordance with an embodiment of the invention, the downspout 100 includes a flexible bead 102, such as the flexible bead 58, sewn or otherwise connected at a top of the downspout 100 and formed

into a ring. The flexible bead 102 maintains a top end of the downspout 100 in an open position so that the downspout 100 may receive water. The remainder of the downspout 100 extending downward from the flexible bead 102 is preferably formed of a flexible, waterproof material and is configured into a tube. The end 104 of the flexible tube may be directed in any desired direction.

(0034) In use, water flows down the rain fly 22 and into the downspout 100. The water may be directed in this manner, for example, by the full gutter 40. Water directed into the downspout 100 flows into the open mouth formed by the flexible bead 102 and out of the end 104.

(0035) The flexible bead 102 provides an advantage in that it permits easy flow of water into the downspout 100. If desired, a downspout could be configured to not include such a flexible bead, but construction with the flexible bead 102 permits easy capture of water directed toward the downspout 100. In addition, the use of flexible material for the flexible bead 102 permits the downspout 100 to be folded into a compact configuration for storage or transport.

(0036) The downspout 100 may be attached to the rain fly 22 in a suitable manner, such as by sewing, adhesive, or another permanent attachment mechanism. Alternatively, the

downspout 100 may be attached to the rain fly 22 so that the downspout 100 is removable. For example, the downspout 100 may be attached by hook and loop fasteners (not shown, but known in the art).

(0037) Although shown attached to the corners 46, 48, the downspout 100 may alternatively be used in other areas. For example, for the rain fly 22, downspouts 100 may be attached at the ends of the partial gutter 42. These downspouts 100 may have their ends 104 suitably directed either along the rain fly 22 or, if the downspout 100 is long enough, to the ground.

(0038) The end 104 of the downspout 100 may be directed so that the rainwater runoff may be directed away from a base of the tent 20 or away from a shelter, if used with a shelter. This feature aids in keeping the tent 20 dry, and may be utilized to avoid puddles in a tent or shelter area.

(0039) The present invention provides a method of controlling and directing rainwater runoff from a rain fly (e.g., the rain fly 22), a shelter, or other covering. The gutter system of the present invention directs the rainwater runoff along the gutter, for example along a rain fly edge, downward to the ends of the gutter. The ends of the gutter

may be at corners of the rain fly, or at other suitable locations. The water directed to the corners or other location(s) may be allowed to fall to the ground or may be directed to run into the downspout 100. If the downspout 100 is used, the runoff water may be directed to a suitable location by directing the end toward the location.

(0040) Other variations are within the spirit of the present invention. Thus, while the invention is susceptible to various modifications and alternative constructions, a certain illustrated embodiment thereof is shown in the drawings and has been described above in detail. It should be understood, however, that there is no intention to limit the invention to the specific form or forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention, as defined in the appended claims.



(0041) All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

(0042) The use of the terms "a" and "an" and "the" and similar referents in the context of describing the invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. The term "connected" is to be construed as partly or wholly contained within, attached to, or joined together, even if there is something intervening. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless

otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., "such as") provided herein, is intended merely to better illuminate embodiments of the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

(0043) Preferred embodiments of this invention are described herein, including the best mode known to the inventors for carrying out the invention. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.